

**Abstract:**

The present invention relates to a nano-structured metal-carbon composite and applications thereof, and more specifically, to a nano-structured metal-carbon composite obtained by consecutively impregnating a transition metal precursor and a carbon precursor in a nano frame and reacting the precursors at high temperature. In the metal-carbon composite of the present invention, metal is orderly polydispersed with less than 1 nanometer within a mesoporous carbon, and metal is chemically combined with carbon. Therefore, the metal-carbon composite is useful for electrocatalyst of fuel cells.